



**DLP-RFID-  
UHF1B**  
LEAD FREE

## **CLASS 1/GEN 2 RFID READER-WRITER**

### **FEATURES:**

- ISO 18000, EPC Class 1–Gen 2 Compatible
- Will Read the UID of Up To 10 Tags Simultaneously
- 18dBm Output Power
- UHF Reader/Writer
- Reverse Polarity SMA Antenna Connector
- FCC/IC Modular Approval in Place
- Permanent, Unique Reader Serial Number Accessible via USB
- Integrated Pass/Fail Beeper
- USB Port Powered from the Host PC (USB 1.1/2.0 Compatible)
- USB Drivers Provided for Windows Vista, XP, XPx64, Server2003, 2000
- Software Development Library Support for Visual C++/Visual Basic

### **APPLICATION AREAS:**

- Real-Time Security
- Personal Identification
- Pharmaceutical Tracking
- Inventory/Asset Management & Tracking
- Library/Book Management & Tracking
- Baggage Tagging
- Sports Event Timing



## 1.0 INTRODUCTION

***Note:*** *The retail boxed version of this product includes the DLP-RFID-UHF1B reader, a retractable USB cable, a small loop antenna and a 3-foot coax as shown in the image above.*

The DLP-RFID-UHF1B is a low-cost, USB-powered module for reading from and writing to ISO 18000-6a, -6b and -6c intelligent RFID transponder tags. It has the ability to both read and write data in addition to reading the unique identifier (UID). All of the DLP-RFID-UHF1B's electronics reside within the compact unit, and all operational power is taken from the host PC via the USB interface.

## 2.0 RFID BASICS

RFID stands for Radio Frequency IDentification. It is an electronic technology whereby digital data encoded in an RFID tag (or transponder) is retrieved utilizing a reader. In contrast to bar code technology, RFID systems do not require line-of-sight access to the tag in order to retrieve the tag's data, and they are well suited to harsh environments.

An RFID tag consists of an integrated circuit attached to an antenna. In the case of the tags used with the DLP-RFID-UHF1B, the antenna is in the form of conductive ink "printed" onto a material that allows for connection to the integrated circuit. This type of passive (battery-free) tag is commonly referred to as an "inlay".

The RFID reader (or "interrogator") is typically a microcontroller-based radio transceiver that powers the tag with a time-varying electromagnetic radio frequency (RF) field. When the RF field passes through the tag's antenna, AC voltage is generated in the antenna and rectified to supply power to the tag. Once powered, the tag can receive commands from the reader. The information stored in the tag can then be read by the reader and sent back to the host PC for processing.

The data in the tag consists of a hard-coded, permanent serial number (or UID) and user memory that can be written to, read from and locked if desired. Once locked, user data can still be read but not changed.

### 3.0 SPECIFICATIONS

<b>Reader Frequency</b>	902.6-927.4MHz
<b>Output Power</b>	18dBm MAX
<b>Range</b>	1-6 Inches (Depends upon the type of RFID tag)
<b>Tags/Protocols Supported</b>	ISO18000-6a, -6b and -6C
<b>Communications Interface</b>	USB 1.1/2.0 Compatible; Mini-B 5-Pin Connector
<b>Operational Power – Active</b>	320mA
<b>Operational Power – Idle</b>	45mA
<b>Antenna Connector</b>	Reverse Polarity SMA*
<b>USB Driver Support</b>	Windows Vista, XP, XPx64, Server2003, 2000, Linux, Mac OSX
<b>Physical Dimensions – Retail</b>	Enclosure: .83x2.3x3.25" typ. (21.1x58.4x82.6mm)
<b>Operating Temperature</b>	0-70°C

\*Please see the Antenna Section for important regulatory details.

### 4.0 PERMANENT READER SERIAL NUMBER

Each DLP-RFID-UHF1B contains a unique, 32-bit, hard-coded serial number that cannot be altered by any means. The serial number can be read via the USB interface and used to identify the reader via the host software.

### 5.0 APPLICATION DEVELOPMENT

A software library is available for free download upon purchase of the DLP-RFID-UHF1B that demonstrates reading the serial number (UID) from transponder tags, writing to the tags, accessing the reader's permanent serial number and controlling the integrated pass/fail beeper.

Additionally, a low-power Mode Enable Command is provided to reduce current consumption to approximately 45mA when communication with a tag is not required.

### 6.0 REGULATORY AGENCY CONSIDERATIONS

#### 6.1 AGENCY IDENTIFICATION NUMBERS

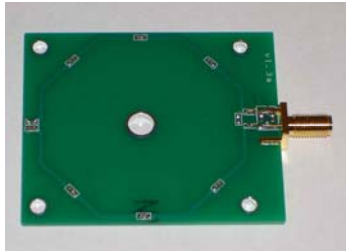
Compliance with the appropriate regulatory agencies is essential in the deployment of all transceiver devices. DLP Design has obtained modular approval for this RF product such that an OEM need only meet a few basic requirements in order to utilize their end product under this approval. Corresponding agency identification numbers are listed below:

<b><u>Part Number</u></b>	<b><u>US / FCC</u></b>	<b><u>CANADA / IC</u></b>
<b>DLP-RFID-UHF1B</b>	<b>SX9UHF1B</b>	<b>5675A-UHF1B</b>

## 6.2 EXTERNAL ANTENNAS

The DLP-RFID-UHF1B is approved for use with selected external antennas. Connection is made via reverse-polarity SMA connectors.

A magnetic loop antenna is provided with each DLP-RFID-UHF1B reader purchased from DLP Design as shown below:



This antenna is well suited for reading the near-field loop incorporated into many Gen-2 tags. This antenna requires a coax cable with a reverse-polarity SMA connector at one end for connection to the DLP-RFID-UHF1B reader. A 3-foot coax cable is provided with each DLP-RFID-UHF1B reader purchased from DLP Design.

## 6.3 FCC/IC REQUIREMENTS FOR MODULAR APPROVAL

Any changes or modifications to the DLP-RFID-UHF1B's printed circuit board or magnetic loop antenna could void the user's authority to operate the equipment.

## 6.4 WARNINGS

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

***This device is intended for use under the following conditions:***

1. The transmitter module may not be co-located with any other transmitter or antenna; and,
2. The module has been approved using the FCC's "unlicensed modular transmitter approval" method. Only loop antennas that do not exhibit a directional gain greater than that of the antenna provided with the device may be used.

As long as these two conditions are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance measures necessitated by the installation of this module (i.e. digital device emissions, PC peripheral requirements, etc.).

Note: In the event that these conditions cannot be met (i.e. co-location with another transmitter), then the FCC authorization is no longer valid, and the corresponding FCC ID may *not* be used on the final product. Under these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

## **6.5 OEM PRODUCT LABELING**

The final end product must be labeled in a visible area with the following text:

**“Contains TX FCC ID: SX9UHF1B”**

## **6.6 RF EXPOSURE**

In order to comply with FCC RF exposure requirements, the antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## **6.7 ADDITIONAL INFORMATION FOR OEM INTEGRATORS**

The end user should NOT be provided with any instructions on how to remove or install the DLP-RFID-UHF1B. This device is pre-certified to operate with the antenna models listed below:

- DLP Design Near-Field Magnetic Loop Antenna

## **7.0 DISCLAIMER**

Neither the whole nor any part of the information contained herein nor the product described in this datasheet may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder.

This product and its documentation are supplied on an as-is basis, and no warranty as to their suitability for any particular purpose is either made or implied. DLP Design will not accept any claim for damages whatsoever arising as a result of the use or failure of this product. Your statutory rights are not affected.

This product or any variant of it is not intended for use in any medical appliance, device or system in which the failure of the product might reasonably be expected to result in personal injury.

This document provides preliminary information that may be subject to change without notice.

## **8.0 CONTACT INFORMATION**

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